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USSR WORK ON THE INTRODUCTION OF DRUGS INTO THE BODY THROUGH THE LUNGS

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Extension of knowledge in the fields of physiology and anatomy of respiratory organs has permitted wide application of therapeutic methods based on the introduction of pharmacologically active substances into the lungs. The work of USSR scientists G. F. Ivanov, M. V. Sergiyevskiy, B. V. Ognev, M. Ye. Marshak, and others has contributed to this knowledge and stimulated this development. We now know that the lungs not only perform the function of gas metabolism, but also participate in blood circulation and lymph circulation as well as in the metabolism of substances other than gases (particularly in water metabolism).

As a result of increase knowledge on this subject, introduction of therapeutic agents into the lungs has been widely adopted during the past 10-20 years. Sulfonamides, disinfectants, and astringent substances are being introduced into the lungs for the treatment of suppurations, bronchiectases, hemorrhages into the lungs, etc. When patients are treated for bronchial asthma, inhalations of adrenalin, ephedrine, and atropine solutions are applied.

Antibiotics, particularly penicillin, are also administered successfully by introducing them into the lungs. This method of administration yields better results in the therapy of chronic suppurative diseases of the lungs than intramuscular introduction of penicillin. In this connection, a new method of treatment has been recently introduced. According to the new procedure, solutions of drugs and antibiotics (penicillin, streptomycin, and ekmolin) are transformed into a light mist which is inhaled by the patient.

To prepare the aerosols which are used for inhalation, compressed air is used. This air passes at a pressure of 0.4-0.8 atmosphere [gauge] and at a rate of 7-12 liters per minute through special atomizers in which the drug solution is dispersed into a suspension of small droplets. The size of the

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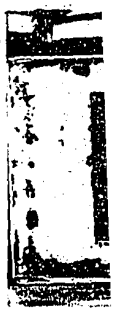

resulting droplets is 0.5-10 microns. Prolonged inhalation of the aerosol (for a period of 25-40 minutes) results in a high concentration of the drug in the lungs. The drugs then exerts a therapeutic effect on the lungs and are resorbed into the blood stream. The special characteristics of blood circulation and lymph circulation in the lungs contribute to prolonged retention of drugs and antibiotics in the lungs.

At present, Soviet scientists have created a variety of simple aerosol inhalation appliances, which permit application on an extensive scale of the method of treatment discussed above.

[The following are captions to figures (not reproduced herein) which are available in the original document in the Library of Congress:]

Plastic atomizer for drugs.

Particles of streptomycin aerosol. One division of the scale corresponds to 10 microns.

Glass atomizer for the preparation of aerosols

Inhalation of an ekmolin aerosol.

Administration of a penicillin aerosol to a baby.

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